

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
14 July 2005 (14.07.2005)

PCT

(10) International Publication Number
WO 2005/064995 A1

(51) International Patent Classification⁷: **H05B 33/14,**
33/22

(21) International Application Number:
PCT/JP2004/019466

(22) International Filing Date:
17 December 2004 (17.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003-432306 26 December 2003 (26.12.2003) JP

(71) Applicant (for all designated States except US): **SEMI-CONDUCTOR ENERGY LABORATORY CO., LTD.**
[JP/JP]; 398, Hase, Atsugi-shi, Kanagawa 2430036 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KUMAKI, Daisuke**

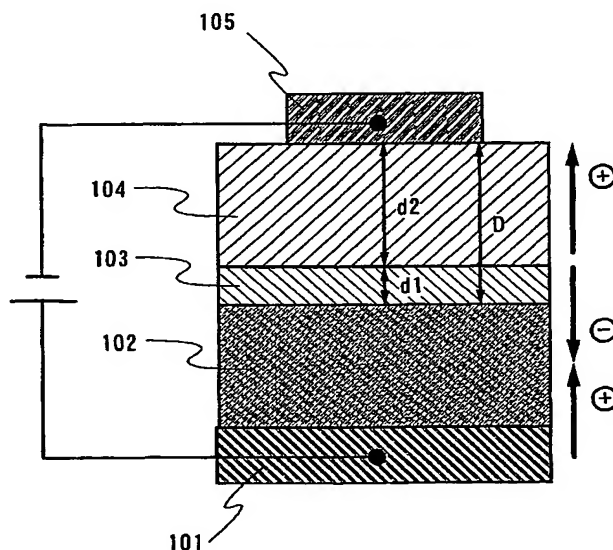
[JP/JP]; c/o Semiconductor Energy Laboratory Co., Ltd., 398, Hase, Atsugi-shi, Kanagawa 2430036 (JP). **SEO, Satoshi** [JP/JP]; c/o Semiconductor Energy Laboratory Co., Ltd., 398, Hase, Atsugi-shi, Kanagawa 2430036 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: **LIGHT-EMITTING ELEMENT**



(57) Abstract: In the present invention, a light-emitting element operating at low driving voltage, consuming low power, emitting light with good color purity and manufactured in high yields can be obtained. A light-emitting element is disclosed with a configuration composed of a first layer containing a light-emitting material, a second layer, a third layer are formed sequentially over an anode to be interposed between the anode and a cathode in such a way that the third layer is formed to be in contact with the cathode. The second layer is made from n-type semiconductor, a mixture including that, or a mixture of an organic compound having a carrier transporting property and a material having a high electron donor property. The third layer is made from p-type semiconductor, a mixture including that, or a mixture of an organic compound having a carrier transporting property and a material having a high electron acceptor property.

WO 2005/064995 A1



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.